

It is claimed:

1. A sensor positioning system for holding sensor units in fixed relative locations in a detachable manner, comprising:
a template having a first surface, a second surface that is parallel to the first surface and cutouts that extend from the first surface to the second surface;
a plurality of sensor units, an individual sensor unit including at least one sensor;
an individual sensor unit of the plurality of sensor units being retained within a cutout such that the location of the individual sensor unit is maintained with respect to the template; and
a plurality of sensor leads, individual sensor leads connecting to individual sensor units.
2. The sensor positioning system of claim 1 wherein an individual sensor unit comprises a chip of material in which a sensor is retained and wherein the material is chosen to be the material of a substrate to which the sensor unit may be attached or a material of having higher thermal conductivity than the material of the substrate.
3. The sensor positioning system of claim 2 wherein the chip has a planar surface with a spiral shaped groove; and
wherein the sensor and a portion of the sensor lead is inserted in the spiral shaped groove and is cemented in position.
4. The sensor positioning system of claim 1 further comprising an alignment tool that aligns the template to the substrate.
5. The sensor positioning system of claim 1 wherein the first surface of the template is coated with an adhesive film to provide a continuous tacky surface.
6. The sensor positioning system of claim 1 wherein portions of the first surface of the template are coated with an adhesive film to provide a tacky surface.

7. The sensor positioning system of claim 5 further comprising a release layer applied to the tacky surface.
8. The sensor positioning system of claim 6 further comprising a release layer removal tool that rolls up the release layer to expose the tacky surface.
9. The sensor positioning system of claim 1 wherein the sensor unit is retained within the cutout by an adhesive tape that extends over the sensor unit and over a portion of the second surface of the template.
10. The sensor positioning system of claim 1 further comprising a lead clamp attached to one or more leads and that is configured to be attached to a substrate.
11. The sensor positioning system of claim 1 further comprising a flat cable assembly through which the plurality of sensor leads pass and a connector to which the plurality of sensor leads attach.
12. A method of positioning sensor units on a substrate surface at predetermined locations, comprising:
aligning a template to the substrate surface such that the template extends across the substrate surface and individual sensor units affixed to the template are positioned at predetermined locations that are specific to the individual sensor units;
detaching a sensor unit from the template; and
attaching the sensor unit to the substrate surface at the predetermined location established by the template.
13. The method of claim 12 wherein aligning a template to the substrate surface is by placing an alignment tool against a corner of the substrate and moving the template so that a corner of the template is against the alignment tool.
14. The method of claim 12 wherein detaching a sensor unit from the template is by peeling back an adhesive tape that is attached to the sensor unit and is also attached

to a portion of the template so that with the tape peeled back, the sensor unit may be moved in relation to the template.

15. The method of claim 12 wherein attaching the sensor unit to the substrate surface is by adding a layer of bonding material between the sensor unit and the substrate surface.

16. The method of claim 15 wherein the bonding material is thermally conductive

17. The method of claim 16 wherein the thermally conductive bonding material contains diamond powder.

18. The method of claim 16 wherein the thermally conductive bonding material contains silver powder.

19. The method of claim 12 wherein attaching the sensor unit to the substrate is by using a pressure sensitive adhesive

20. A sensor positioning system for aligning sensor units to predetermined locations on a surface of a transparent substrate, comprising;
a template that has visible markings that represent the predetermined locations at which the sensor units are to be located;
the template being capable of being rolled or folded;
a plurality of sensor units, sensor units individually comprising at least one sensor;
a plurality of sensor leads, an individual sensor lead attached to a sensor unit at one end and attached to a connector at the other end; and
a lead clamp that is attached to the plurality of sensor leads and that is adapted to be attached to a substrate;

21. The sensor positioning system of claim 20 further comprising a flat cable assembly through which the plurality of sensor leads passes.

22. The sensor positioning system of claim 20 wherein the sensor leads are retained by winding the sensor leads around bobbins prior to attachment to the substrate.
23. The sensor positioning system of claim 20 wherein the visible markings and the sensor units are individually identified to indicate which sensor unit corresponds to an individual predetermined location.
24. A method of positioning sensor units on a surface of a planar transparent substrate at predetermined locations comprising:
placing a template that has alignment marks against a first surface of the substrate such that the alignment marks are visible through the substrate;
visually aligning a sensor unit with a predetermined location indicated by alignment marks, the sensor unit having a sensor lead that extends through a cable assembly;
and
attaching the sensor unit to a second surface of the substrate at the predetermined location.
25. The method of claim 24 further comprising attaching a lead clamp to the second surface of the substrate, the lead clamp holding sensor leads that connect to individual sensor units.
26. The method of claim 24 further comprising extending sensor leads between the lead clamp and the sensor units from a coiled configuration to an extended configuration.
27. The method of claim 26 wherein the coiled configuration is maintained by coiling the sensor lead around a bobbin.